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ABSTRACT

The invention includes methods of making lithography photomask blanks. The invention also includes lithography photomask blanks and preforms for producing lithography photomask. The method of making a lithography photomask blank includes providing a soot deposition surface, producing SiO<sub>2</sub> soot particles and projecting the SiO<sub>2</sub> soot particles toward the soot deposition surface. The method includes successively depositing layers of the SiO<sub>2</sub> soot particle on the deposition surface to form a coherent SiO<sub>2</sub> porous glass preform body comprised of successive layers of the SiO<sub>2</sub> soot particles and dehydrating the coherent SiO<sub>2</sub> glass preform body to remove OH from the preform body. The SiO<sub>2</sub> is exposed to and reacted with a fluorine containing compound and consolidated into a nonporous silicon oxyfluoride glass body with parallel layers of striae. The method further includes forming the consolidated silicon oxyfluoride glass body into a photomask blank having a planar surface with the orientation of the striae layer parallel to the photomask blank planar surface.

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